2017 Stream Survey Report

NORTH BRANCH EMBARRASS RIVER

Rotation (WBIC 301300)

Shawano County

Prepared by Joe Dax

Introduction and Objectives

The North Branch Embarrass River is a 34.75 mile stream with 33.9 miles of Class I, II, and III trout water. It originates in the northwest corner of Shawano county, flows southeast through Bowler and eventually converges with the South Branch at Caroline to become the Embarrass River. Eighteen public road crossings along with 40 acres of DNR managed public land abutting the river provide fishing access to the North Branch Embarrass River. Objectives of the rotational surveys are to determine species composition, relative abundance, and size structure for trout and other gamefish present.

Regulations Category: Green **Size Limit:** None **Daily Bag Limit:** 5 (in total)

WISCONSIN DNR CONTACT INFO.

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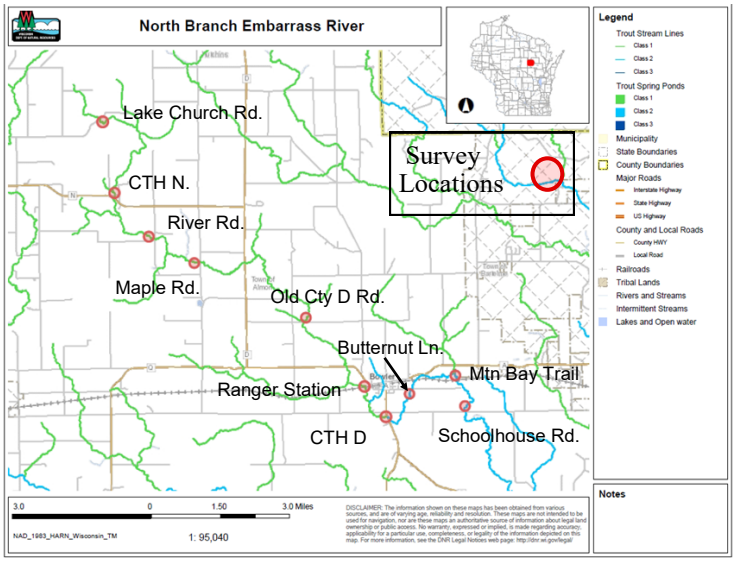
Survey Information

Station	Survey Date	Station Length	Temperature (°F)	Mean Stream Width	GPS (Start/Finish)	Gear	Number of Netters	Index of Biotic Integrity
Maple Rd.	07/10/2017	570 ft	60	16.3 ft	44.90360, -89.06254 -	Tow-Barge Shocker	3	Yes
Ranger Station	08/09/2017	966 ft	59	27.6 ft	44.86383, -88.99095 44.86417, -88.99371	Tow-Barge Shocker	3	No
CTH D	08/09/2017	1,120 ft	58	32.0 ft	44.85309, -88.97989 44.85419, -88.98257	Tow-Barge Shocker	3	No
Old County D.	08/07/2017	654.5 ft	58	18.7 ft	44.88479, -89.01645 44.88594, -89.01550	Tow-Barge Shocker	3	No
Lake Church Rd.	08/07/2017	330 ft	55	3.7 ft	44.94796, -89.10577 44.94898, -89.10638	Tow-Barge Shocker	3	No
Schoolhouse Rd.	08/09/2017	1,001ft	58	28.6 ft	44.85570, -88.94691 44.85698, -88.94631	Tow-Barge Shocker	3	No
River Rd.	07/10/2017	532 ft	59	15.2 ft	44.91087, -89.08264 44.91111, -89.08427	Tow-Barge Shocker	3	No
Mountain Bay Trail	08/09/2017	980 ft	61	27.8 ft	44.86572, -88.95058 44.86776, -88.95130	Tow-Barge Shocker	3	Yes
Old CTH N	07/05/2017	501 ft	58	14.3 ft	44.92474, -89.09982 44.92597, -89.10072	Tow-Barge Shocker	3	No
Butternut Ln.	08/09/2017	813 ft	62	23.2 ft	44.86275, -88.96990 44.86124, -88.97111	Tow-Barge Shocker	3	No



Survey Method

- All streams are sampled according to WDNR wadeable streams monitoring protocols. The North Branch Embarrass River is on a six year rotation schedule with 10 sites identified for the segment of stream in Shawano County.
- All sampling stations are electrofished using either a towed barge shocker or backpack shocker.
- Sampling distance is at least 35 times the mean stream width or a minimum of 330 ft.(100 meters).
- All trout and other gamefish are measured for length and examined for fin-clips.
- In at least one stream segment (if multiple stations are being sampled) all fish species are collected and counted for calculation of an Index of Biotic Integrity (IBI).
- Metrics used to describe trout populations include average length, catch per unit effort (CPUE), and length frequency distributions.

Metric Descriptions

- **Catch per unit effort (CPUE)** is a method of quantifying fish population relative abundance. For all trout surveys, we typically quantify CPUE as the number of a given size class of trout captured per mile of stream. CPUE indexes are compared to other trout streams throughout the state of Wisconsin by what percentile (PCTL) they fall out in . For example, if a CPUE is in the 90th percentile, it is higher than 90% of the other CPUEs in the state. CPUE percentiles can also be used to categorize trout abundance as low density (<33rd percentile), moderate density (33rd - 66th percentile), high density (66th - 90th percentile), and very high density (> 90th percentile).

- **Index of Biotic Integrity (IBI)** is a rating of environmental quality based on the fish assemblage. Scores of 90-100 indicate excellent stream quality while scores less than 30 indicate poor stream quality. Our analysis utilizes the IBI for Wisconsin coldwater streams. Coldwater streams in Wisconsin are those in which the maximum daily mean water temperature is usually <22°C (71.6°F). A coolwater stream IBI may also be used when a stream doesn't fit the temperature criteria for a coldwater stream.

- **Length frequency distribution** is a graphical representation of the number or percentage of fish captured by half inch or one inch size intervals.

Size and Abundance (CPUE) Metrics

Station	Species	Total Number Sampled	Average Length (inches)	Length Range (inches)	CPUE calculated as the number of trout of a given size per mile (Number in parentheses represents the statewide percentile of a given metric)					
					Total CPUE (PCTL)	YOY CPUE	≥5" CPUE (PCTL)	≥8" CPUE (PCTL)	≥10" CPUE (PCTL)	≥12" CPUE (PCTL)
Maple Rd.	Brook trout	64	6.9	(5.3 - 9.9)	593 (76th)	0	593 (91st)	56 (77th)	-	-
Ranger Station	Brook trout	103	6.5	(2.0 - 12.0)	563 (75th)	49	570 (91st)	115 (90th)	38 (94th)	5 (66th)
CTH D	Brook trout	138	6.0	(2.5 - 10.2)	651 (78th)	75	547 (90th)	52 (75th)	5 (66th)	-
Old County D.	Brook trout	189	5.4	(2.0 - 10.6)	1,545 (93rd)	483	1,016 (97th)	156 (93rd)	16 (84th)	-
Lake Church Rd.	Brook trout	63	3.9	(1.9 - 8.6)	1,000 (87th)	683	317 (81st)	48 (74th)	-	-
Schoolhouse Rd.	Brook trout	33	6.3	(2.7 - 8.7)	174 (48th)	37	137 (59th)	21 (55th)	-	-
River Rd.	Brook trout	67	6.1	(2.2 - 8.6)	665 (78th)	30	614 (92nd)	20 (54th)	-	-
Mountain Bay Trail	Brook trout	56	6.2	(2.1 - 11.8)	302 (60th)	75	226 (72nd)	59 (78th)	11 (76th)	-
Old CTH N	Brook trout	17	5.4	(2.1 - 8.6)	179 (48th)	53	126 (57th)	11 (41st)	-	-
Butternut Ln.	Brook trout	27	7.7	(3.0 - 12.2)	175 (48th)	19	156 (62nd)	78 (83rd)	26 (90th)	6 (69th)

Size and Abundance (CPUE) Metrics

Station	Species	Total Num-ber Sampled	Average Length (inches)	Length Range (inches)	CPUE calculated as the number of trout of a given size per mile (Number in parentheses represents the statewide percentile of a given metric)						
					Total CPUE (PCTL)	YOY CPUE	≥6" CPUE (PCTL)	≥8" CPUE (PCTL)	≥10" CPUE (PCTL)	≥12" CPUE (PCTL)	≥15" CPUE (PCTL)
Ranger Station	Brown trout	41	8.4	(2.6 - 18.2)	224 (60th)	5	180 (68th)	98 (65th)	49 (64th)	32 (55th)	11 (84th)
CTH D	Brown trout	156	6.8	(2.2 - 20.3)	735 (83rd)	132	491 (87th)	203 (80th)	71 (72nd)	24 (66th)	5 (70th)
Old County D.	Brown trout	62	7.3	(2.8 - 18.9)	507 (76th)	16	393 (83rd)	90 (64th)	32 (57th)	32 (72nd)	16 (89th)
Schoolhouse Rd.	Brown trout	9	9.4	(3.5 - 16.0)	47 (32nd)	5	42 (39th)	21 (37th)	21 (50th)	11 (53rd)	5 (70th)
Mountain Bay Trail	Brown trout	16	7.5	(6.0 - 10.0)	86 (42nd)	0	86 (54th)	22 (38th)	5 (29th)	-	-
Butternut Ln.	Brown trout	17	9.5	(2.8 - 18.1)	110 (46th)	6	97 (56th)	65 (57th)	52 (65th)	26 (68th)	6 (74th)

Species Community and IBI for Maple Road

Species Sampled	Total	IBI Score	Integrity Rating
BROOK TROUT	64	Coldwater: 70	Coldwater: Good
BROWN TROUT	2		
CREEK CHUB	12		
PEARL DACE	8		
WHITE SUCKER	5		

Species Community and IBI for Mountain Bay Trail.

Species Sampled	Total	IBI Score	Integrity Rating
BLACKSIDE DARTER	2	Coldwater: 50	Coldwater: Fair
BROOK TROUT	56		
BROWN TROUT	16		
CENTRAL MUDMINNOW	5		
COMMON SHINER	2		
CREEK CHUB	84		
FATHEAD MINNOW	1		
GREEN SUNFISH	1		
JOHNNY DARTER	4		
NORTHERN HOG SUCKER	1		
NORTHERN PEARL DACE	99		
SOUTHERN REDBELLY DACE	1		
TIGER TROUT	1		
WESTERN BLACKNOSE DACE	1		
WHITE SUCKER	109		

Summary

- Brook trout density in the North Branch Embarrass River was moderate to high with most sites being between the 60th and 75th percentile when compared to statewide data.
- Young of year (YOY) brook trout density was variable ranging from 0 to 683 per mile, but <100 YOY brook trout per mile were captured at most sites.
- Size structure of brook trout was skewed towards smaller individuals as brook trout >10 in. were only captured at half the sites and brook trout >12 in. were only captured at 20% of the sites. Possible locations for habitat improvements with the goal of increasing growth rates and size structure should be assessed.
- Brown trout were sampled in moderate densities in the lower sections of the North Branch Embarrass River. Brown trout size structure was optimal with brown trout >15 inches being captured at five of the six sites where brown trout were captured and brown trout >18 in. were captured at four of the six sites.
- The fish assemblage sampled in the North Branch Embarrass River at the Mountain Bay Trail indicated a fair coldwater environment whereas farther upstream in the Class I section, the fish assemblage indicated a good coldwater environment.
- At some sites, brook trout densities were similar to the last survey in 2011 (e.g., River Rd. and Maple Rd.); whereas, brook trout densities at the Schoolhouse Rd. in 2017 increased by approximately 1,000% compared to what was captured in 2011.
- Brown trout densities were only slightly higher in 2017 compared to previous year's surveys.